Newsletter N°12 on Insects for feed, food and bioconversion of organic substrates

Items published between 01 November and 31 December 2024

This newsletter is produced by a research team on entomoconversion and the “Direction pour la Science Ouverte” (DipSO). It is the result of multi- source monitoring (media, articles, ...).

Scope :

- **Europe/France**
- **Thematics axes** : insects (Tenebrio molitor et Hermetia Illucens) , substrates (organic waste, by-products, ...), industrials applications and products (frass, fertilizer, ...)
- **Sources** : articles, information on ongoing and completed projects, regulatory documents, calls for expressions of interest, private sector activities.

Note : Items in this newsletter do not represent INRAE's position.

Substrate - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

31/12/2024

Plastic-eating insects bring hope for waste in Kenya

In a bid to lessen the harmful effects from conventional ways of disposing of plastics, scientists in Kenya have found a promising solution for plastic disposal through mealworm beetles. Fathiya Khamis, a molecular biologist said that despite previous ...

wastemanagement.einnews.com

tenebrio molitor

05/12/2024

University uses insects to tackle food waste, malnutrition - University World News

University uses insects to tackle food waste, malnutrition University World News

consent.google.com

02/12/2024

Insect Mealworm Breeding Tray - Features and Applications

In recent years, the demand for sustainable protein sources has surged, leading to a growing interest in insect farming. Among the various insects that can be bred, mealworms (Tenebrio molitor) have emerged as a popular choice due to their high nutritional value and minimal environmental impact. To facilitate the breeding process, specialized equipment such as the Insect Breeding Tray has been developed. What is a Insect Breeding ...

abnews-wire.blogspot.com

tenebrio molitor

21/11/2024

Valorisation des déchets et insectes comestibles : collaboration scientifique en Indonésie

Valorisation des déchets et insectes comestibles : collaboration scientifique en Indonésie elsa.barreda@ird.fr jeu 21/11/2024 - 09:41 Le mois d'octobre, une mission en Indonésie, financée par Campus France dans le cadre du programme PHC Nusantara, a permis aux chercheurs Philippe Le Gall et Pierre-Olivier Maquart de l'IRD (UMR EGCE) de collaborer avec l'Institut Teknologi Bandung. Cette mission s'inscrit dans un contexte ...

www.ird.fr

hermetia illucens

14/11/2024

Aquafeed.com | Canadian insect meal producer opens first commercial scale BSFL facility

The Nova Scotia-based company opened its first commercial farm on the periphery of Halifax.

www.aquafeed.com

hermetia illucens

Substrate - articles

Sources : HAL, Pubmed, BASE, MDPI, F100Research, Jounal of Insects as Food and Feed, ...

31/12/2024

Sodium selenite enhanced the selenium content in black soldier fly - Li et al.

This study focuses on the effects of different levels of sodium selenite on the growth, selenium content, and antioxidant capacity of black soldier fly (Hermetia illucens). The experiment used different doses of sodium selenite for treatment, including a basic diet with no supplements (control) and diets supplemented with 10 mg/kg (Se10), 20 mg/kg (Se20), 30 mg/kg (Se30), and 40 mg/kg (Se40) sodium selenite, and results show that sodium selenite supplementation significantly increases selenium content and improves selenium utilization ...

www.nature.com

hermetia illucens

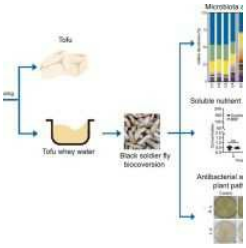
30/12/2024

Investigation of Bacillus cereus growth and sporulation during Hermetia illucens larval rearing - van Kessel et al.

Insects are increasingly used as an alternative protein source for feed and food production. One of the main biological hazards associated with edible insects is the bio-accumulation of foodborne pathogenic microorganisms. In this study, the interaction of larvae of the black soldier fly (BSFL, Hermetia illucens (L.), Diptera: Stratiomyidae) with the foodborne pathogen Bacillus cereus was explored. As such, BSFL were reared on a substrate of wheat-based insect feed mixed with water, which was inoculated with either B.

www.cell.com

hermetia illucens



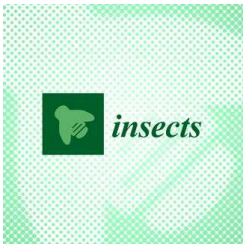
30/12/2024

Black soldier fly and microbiome collaborate to bioconvert the tofu whey water in an efficient and environment-friendly manner - Ji et al.

Tofu whey water (TWW), a byproduct of tofu production, contains high concentrations of organic compounds, but most TWW is directly discarded into the ...

www.sciencedirect.com

hermetia illucens



29/12/2024

Evaluating Different Supplements on the Growth Performance and Bioconversion Efficiency of Kitchen Waste by Black Soldier Fly Larvae - Chen et al.

Black soldier fly larvae (BSFL) convert kitchen waste into high-quality insect feed. However, the optimal amount of auxiliary materials needed to improve the physical and chemical properties of kitchen waste and enhance BSFL bioconversion efficiency remains unresolved. In this study, maize stover and BSFL frass were added to kitchen waste (in groups G2 and G3, respectively) to explore their effects on the growth performance and ...

www.mdpi.com

hermetia illucens

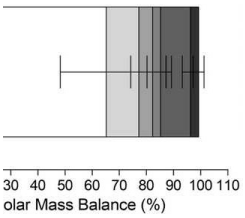
24/12/2024

Comprehensive industry-relevant black soldier fly bioconversion characterisation by a novel chamber system - Fuhrmann et al.

Black soldier fly larvae (BSFL) efficiently convert biowaste into valuable animal feed. Sustainable and reliable bioconversion is desirable to achieve...

www.sciencedirect.com

hermetia illucens



19/12/2024

Bioconversion of aflatoxin-contaminated groundnut press cake by larvae of black soldier fly Hermetia illucens results in a complete mass balance for aflatoxin B1 - Niermans et al.

Groundnuts are considered as one of the most important cultivated food crops globally. Groundnuts are used for vegetable oil production, which generate a variety of by-products, such as peanut press cake (PPC). Groundnuts are sensitive to infection by aflatoxigenic fungi. Aflatoxins are highly toxic to both humans and livestock, and contaminated crops containing high aflatoxin concentrations are deemed unsafe for consumption and ...

www.nature.com

hermetia illucens

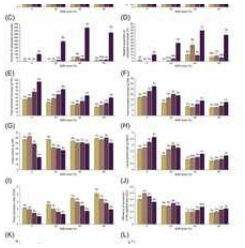
17/12/2024

Strike while the iron is hot: unravelling the impact of dietary iron on two edible insects - First et al.

Abstract Edible insects are key players in the alternative protein market. Alongside their high protein content, edible insects contain abundant trace minerals, including iron. Given the lack of sustainable and bioavailable iron sources, edible insects are a promising iron source in both human and livestock diets. However, little is known about how the iron concentration in edible insects can be manipulated. This study aims to ...

brill.com

hermetia illucens | tenebrio molitor



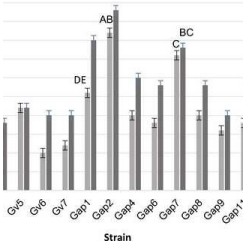
13/12/2024

Bioconversion efficiency and chemical composition of Hermetia illucens larvae fed spent mushroom substrates - Nayak et al.

Spent mushroom substrate (SMS) is a by-product remaining after harvesting mushrooms. We evaluated the effect of substituting chicken feed with 0–100% of Pleurotus eryngii and Lentinula edodes SMS at different stocking densities (200–1000 larvae/box) on development, composition, and substrate reduction of black soldier fly (Hermetia illucens) larvae. Although the survival rate was not significantly different, feeding pure SMS led ...

link.springer.com

hermetia illucens



13/12/2024

Determination of the entomopathogenic effects of different Bacillus species and Pantoea dispersa on agricultural and forest pests: host range study - Usta et al.

A large diversity of pest species can be found in agricultural and forestry regions due to Türkiye's various climatic and geographic characteristics. These pests can cause significant crop loss and economic harm. This study aims to determine the efficacy of the local entomopathogen Bacillus species bacteria against various agricultural and forest pests by investigating the mortality rates on Dendroctonus micans (Coleoptera: Cur...

link.springer.com

tenebrio molitor

12/12/2024

Closing the loop with pretreatment and black soldier fly technology for recycling lignocellulose-rich organic by-products: A progressive review - Rehman et al.

The rise of the global population and improving living standards have increased food demand, imposing significant pressure on agricultural systems. As...

www.sciencedirect.com

hermetia illucens

07/12/2024

Toxicokinetics and tissue dynamics approaches to evaluate the accumulation and elimination of cadmium in black soldier fly larvae - Zhang et al.

The black soldier fly larvae (BSFL) is a highly valued resource insect, renowned for its efficient and eco-friendly approach to the treatment of organ...

www.sciencedirect.com

hermetia illucens

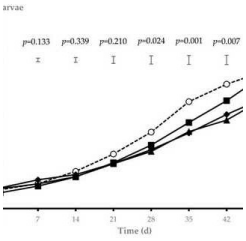
06/12/2024

Biowaste treatment using black soldier fly larvae: Effect of substrate macronutrients on process performance - Grossule et al.

Black soldier fly larvae (BSFL) process is emerging as a promising alternative for the treatment of biowaste. Process performance (such as survival ra...

www.sciencedirect.com

hermetia illucens



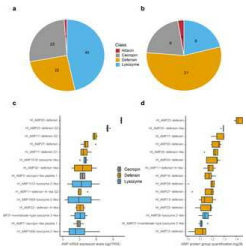
04/12/2024

Bread By-Product and Maize Silage as Alternative Ingredient Feeds for Production of Tenebrio molitor Larvae in High-Concentrate Substrates - Fondevila et al.

Bread by-product and maize silage as substrates for Tenebrio molitor larvae were studied in four isonitrogenous diets: a control substrate (CTL) made of wheat grain, wheat bran, and soybean meal and three diets where wheat grain and wheat bran were partly substituted with bread by-product (BBP) or with this and either a low (MSL) or high (MSH) proportion of maize silage (170 or 310 g/kg, respectively). Larval weight was weekly ...

www.mdpi.com

tenebrio molitor



28/11/2024

Regulation of antimicrobial peptides in Hermetia illucens in response to fungal exposure - Herman et al.

The black soldier fly (Hermetia illucens) is important for antimicrobial peptide (AMP) research due to its exposure to diverse microorganisms. However, the impact of different fungi on AMP abundance in H. illucens remains unexplored. We studied the induction of AMP expression under basal conditions and with three fungi: non-pathogenic Candida tropicalis, Saccharomyces cerevisiae, and pathogenic Beauveria bassiana, using RNA-sequencing ...

www.nature.com

hermetia illucens

26/11/2024

Modulating the fatty acid composition of black soldier fly larvae via substrate fermentation - IJdema et al.

Black soldier fly larvae (BSFL, Hermetia illucens) contain high amounts of proteins and essential amino acids and are therefore an appropriate feed so...

www.sciencedirect.com

hermetia illucens

22/11/2024

Effect of heavy metal on growth of black soldier fly larvae (Hermetia illucens): Accumulation, excretion and gut microbiome - Liu et al.

The growth and gut microbiome of black soldier fly, Hermetia illucens (Diptera: Stratiomyidae), larvae may be impacted by heavy metals. The larval growth was improved by exposure to low concentration...

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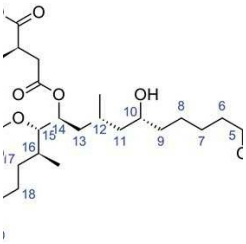
hermetia illucens



22/11/2024

Evaluating Tenebrio molitor (Coleoptera: Tenebrionidae) for the reduction of fumonisin B1 levels in livestock feed - Paulk et al.

Abstract. The yellow mealworm, Tenebrio molitor, L., can be an important component of the circular economy because of its ability to transform a variety of

academic.oup.com

tenebrio molitor

20/11/2024

Agricultural by-products as functional substrates modulate the growth, the cytoprotective mechanisms and the antioxidant potential of Tenebrio molitor (Coleoptera: Tenebrionidae) - Chatzimpalasis et al.

Abstract The emergence of insects as a nutrient source in the human diet and animal feed propels the urgent development of a viable mass production sector. The objective of the present study was to evaluate the suitability of rice and corn by-products as substrates for mealworm rearing namely Tenebrio molitor L. (Coleoptera: Tenebrionidae) in terms of growth, stress response, and antioxidant defence. In this context, mealworm larvae ...

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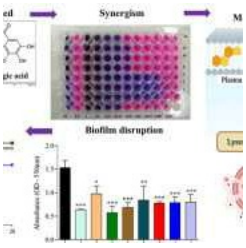
tenebrio molitor



19/11/2024

n -butanol fraction of Terminalia catappa possesses anti-Candida albicans properties and in vivo action on Tenebrio molitor alternative infection model - Galvão Rocha et al.

Current treatment of Candida infections is threatened by antifungal drug resistance. Thus, medicinal plants have been studied to identify new and high...

www.sciencedirect.com

tenebrio molitor

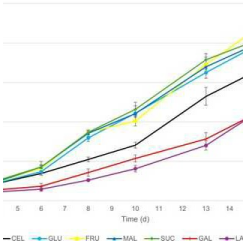
17/11/2024

Evaluation of carrot and agroindustrial residues for obtaining Tenebrio molitor (yellow mealworm) powder enriched in bioaccessible provitamin A and colourless carotenoids - Benítez-González et al.

In this pilot study Tenebrio molitor larvae were fed with two residues (olive leaf meal and spent Pleurotus ostreatus substrate meal) and wheat flour ...

www.sciencedirect.com

tenebrio molitor



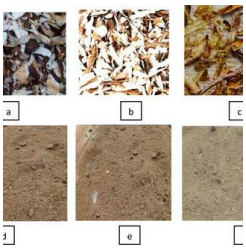
15/11/2024

Common soluble carbohydrates affect the growth, survival, and fatty acid profile of black soldier fly larvae Hermetia illucens (Stratiomyidae) - Carpentier et al.

The black soldier fly, Hermetia illucens (L. 1758), is an omnivorous saprophagous insect with a high potential for valorizing organic by-products rich in carbohydrates. Among carbohydrates, H. illucens relies on soluble sugars for the growth and storage lipid synthesis. This study aimed to assess the impact of common soluble sugars on the development, survival, and fatty acid composition of H. illucens. Monosaccharides and disaccharides ...

www.nature.com

hermetia illucens



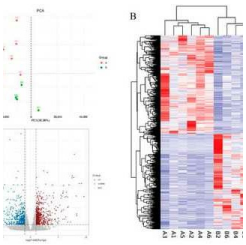
14/11/2024

Rearing of black soldier fly (Hermetia illucens) larvae as a tool for managing agricultural byproducts - Vodounnou et al.

The aim of this study was to evaluate the effects of cassava, yam and sweet potato peels on Black Soldier Fly Larvae (BSFL) production. Four different treatments were performed in triplicate in a completely random block consisting of soy bran (TSB), cassava peel (TCP), yam peel (TYP) and sweet potato peel (TPP). A density of 1 larva/g of substrate was used with a uniform ratio of 100 mg/larva/day. Larval growth duration was ten ...

link.springer.com

hermetia illucens



12/11/2024

Swill and Pig Manure Substrates Differentially Affected Transcriptome and Metabolome of the Black Soldier Fly Larvae - Zhang et al.

Black soldier fly larvae (Hermetia illucens) (BSFL) are insect larvae with significant ecological and economic value. This study aims to investigate whether swill and manure had any effects on the transcriptome and metabolome of BSFL. Through high-throughput transcriptome sequencing, we found that larvae fed with swill exhibited higher levels of gene expression, especially with the upregulation of genes related to energy metabolism, ...

www.mdpi.com

hermetia illucens

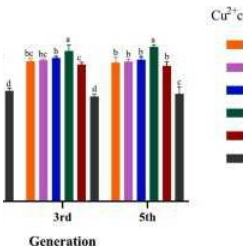
12/11/2024

Tenebrio molitor (Coleoptera: Tenebrionidae) as an alternative host for the study of pathogenicity in Candida auris - dos Santos Rodrigues et al.

Candida auris, a multidrug-resistant fungal pathogen, has emerged as a significant global health threat due to its high transmission and mortality rat...

www.sciencedirect.com

tenebrio molitor



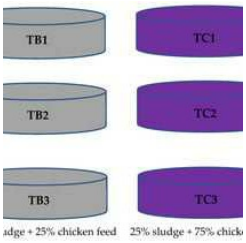
09/11/2024

Antioxidant response fail to rescue growth of Hermetia illucens L. larvae induced by copper accumulated during long-term exposure - Zhang et al.

Antioxidant indices and hemocytes apoptosis in the 6th instar larvae of Hermetia illucens., and their correlation with larval growth were evaluated by...

www.sciencedirect.com

hermetia illucens



08/11/2024

Evaluating the Influence of Nutrient-Rich Substrates on the Growth and Waste Reduction Efficiency of Black Soldier Fly Larvae - Albalawneh et al.

Background: The black soldier fly (Hermetia illucens) has emerged as a promising tool in sustainable waste management, owing to its larvae's ability to efficiently convert organic waste into valuable biomass. Objective: This study investigates the impact of various substrate compositions on the growth, waste reduction efficiency, and bioconversion rate of black soldier fly (BSF) larvae (Hermetia illucens). The aim is to optimize ...

www.mdpi.com

hermetia illucens

08/11/2024

Amino acid requirements of yellow mealworm and black soldier fly larvae - Spranghers et al.

Abstract In order to achieve optimal growth and health of farm animals, a different amount/ratio of essential amino acids in the feed is necessary in each phase of life. Knowledge about which amino acids are essential and in which quantities/proportions they are best administered has already greatly advanced the pig and poultry sector and is still being generated today. For the still young, rapidly developing insect sector, this ...

brill.com

hermetia illucens tenebrio molitor

08/11/2024

An investigative study to utilise the Fusarium-damaged wheat as a feedstock for the black soldier fly larvae (Hermetia illucens) - Kumar et al.

Abstract This study investigated Fusarium-damaged wheat kernels (FDK) as a potential feeding substrate for black soldier fly larvae (Hermetia illucens; BSFL). Fusarium-damaged kernels are considered unsuitable for food and feed due to the presence of mycotoxins. Mycotoxins, like deoxynivalenol (DON), pose health risks when consumed by animals at concentrations exceeding the limits established by the Canadian Food Inspection Agency. ...

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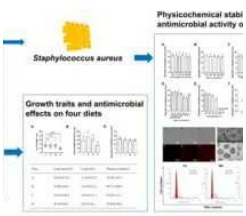
hermetia illucens



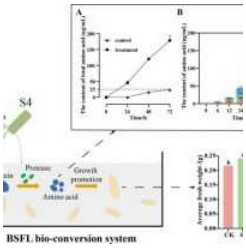
06/11/2024

Dietary Influence on Growth, Physicochemical Stability, and Antimicrobial Mechanisms of Antimicrobial Peptides in Black Soldier Fly Larvae - Liu et al.

Safe antibiotic substitutes are needed given the rise in antimicrobial resistance, environmental contamination, and stringent antibiotic regulations. Insect-derived antimicrobial peptides (AMPs) are promising candidates due to their antimicrobial activity, stability, and safety. This study investigates the antimicrobial mechanism of crude AMP extracts and their physicochemical characteristics in black soldier fly larvae (BSFL). ...

www.mdpi.com

hermetia illucens



05/11/2024

Characteristics and biological mechanism of protein degradation by the black solider fly (Hermetia illucens L.) larvae gut strain Bacillus subtilis S4 - Gao et al.

The black solider fly larvae (BSFL) can efficiently convert nitrogen in organic waste into insect protein. Bacillus subtilis S4, an efficient protein-...

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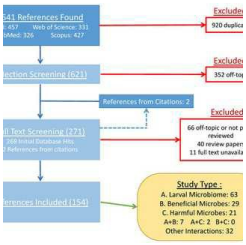
hermetia illucens



05/11/2024

Black Soldier Fly (Hermetia illucens) Microbiome and Microbe Interactions: A Scoping Review - Lin et al.

Black soldier fly (Hermetia illucens, BSF) is farmed worldwide to convert organic waste into usable biomaterials. Studies on the larval microbiome have been carried out to check for symbiotic or pathogenic microbes and their respective functions and fates. Some studies tested these microbes for industrial applications, while others tested the effects of exogenous microbes as probiotics or for substrate pre-processing to improve ...

www.mdpi.com

hermetia illucens

05/11/2024

Effect of patulin on the growth and nutrient composition of black soldier fly larvae - Xiao et al.

Abstract Black solider fly (BSF, Hermetia illucens) is a common insect in most part of North America, Europe, and Asia, and it is one of the most promising alternative protein sources for animal consumption. BSF can be fed on food waste and agricultural byproducts, which are usually contaminated with mycotoxins. Therefore, it is important to study the fate of mycotoxins in BSF and how mycotoxins will affect the growth and nutrient ...

brill.com

hermetia illucens

04/11/2024

α-Solanine and α-Tomatine Affect the Retrocerebral Complexes of Tenebrio molitor and Zophobas atratus Beetles - Adamski et al.

Solanaceae glycoalkaloids caused significant changes in the retrocerebral complexes of Tenebrio molitor and Zophobas atratus beetles.

onlinelibrary.wiley.com

tenebrio molitor

03/11/2024

Bioconversion of sulfamethazine-contaminated chicken manure by black soldier fly larvae: Effects on antibiotic resistance genes and microbial communities - Cai et al.

Sulfamethazine (SM2), a widely detected antibiotic in livestock manure, poses environmental and health risks due to its persistence and the proliferat...

www.sciencedirect.com

hermetia illucens

01/11/2024

Make it a standard? The creation and variability assessment of a consensus standard protocol for Tenebrio molitor larvae feeding trials - Deruytter et al.

Abstract Interest in the nutrition of the yellow mealworm (Tenebrio molitor L.) larvae is on the rise, leading to an increase in publications on this topic. The absence of a standard protocol and resulting differences in experimental designs reduces comparability among studies and impedes research on mealworm nutrition. To address this, a consensus standardised protocol was developed specifically for the evaluation of mealworm ...

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tenebrio molitor

Product - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

19/12/2024

Pet “superfoods”: tasty, healthy, sustainable – International Platform of Insects for Food and Feed, Brussels

Pet “superfoods”: tasty, healthy, sustainable The pet market is growing more than ever before. Its market size in Europe was worth USD 5.75 billion in 2023 alone. Estimations for the European market are around USD 11.74 billion by 2032 from USD 6.23 billion in 2024, growing at a CAGR of 8.24% from 2024 to 2032. All...

ipiff.org

18/12/2024

Discover the Buzz: Is Insect Protein Powder the New Whey?

What exactly is protein powder made from worms? Exploring Insect-Based Sources Of Proteins One protein source that scientists believe to be an effective alternative is insects, especially worms like the mealworm; they are packed with vitamins, minerals, and essential amino acids, making mealworms a great option that can help meet the nutritional needs of the [...] The post Discover the Buzz: Is Insect Protein Powder the New Whey? ...

www.techicy.com

hermetia illucens tenebrio molitor

17/12/2024

lifestyle Grab your grub: $4.90 mealworm snack lands at Sheng Siong, joining Singapore's insect-food scene

Insects as food have long been seen as something outside the norm — it's often classified as exotic cuisine, novelty items or the stuff of dare challenges. But now, companies like Insect Food are changing that narrative as their new mealworm snack ...

lifestyle.einnews.com

tenebrio molitor

16/12/2024

Agroloop opens industrial-scale insect protein processing plant

Agroloop has opened one of Central Europe's most important alternative animal feed protein plants in Hungary with an investment of €30 million. FreezeM will provide weekly support to the Agroloop plant, the first industrial-scale insect protein processing facility dedicated to feed production, with the propagation and supply of black soldier fly larvae from its breeding [...] Agroloop opens industrial-scale insect protein processing ...

www.feedandadditive.com

hermetia illucens

14/11/2024

Innovafeed secures $11.8m USDA grant for insect-based fertilizer, fine tunes process at Decatur pilot plant

Insect waste (frass)—which contains nitrogen, phosphorus, and potassium—boosts soil health and provides a more balanced, slow-release nutrient profile than synthetic fertilizer, claims Innovafeed. The post Innovafeed secures $11.8m USDA grant for insect-based fertilizer, fine tunes process at Decatur pilot plant appeared first on AgFunderNews.

agfundernews.com

hermetia illucens

12/11/2024

Western diets need to change to meet sustainability challenges. How resistant will consumers be to munch on insects or plant-based meats

What will the diets of the future look like? The answer depends in part on what foods Westerners can be persuaded to eat. These consumers are increasingly being told their diets need to change. Current eating habits are unsustainable, and the global demand for meat is growing. Recent years have seen increased interest and investment in alternative proteins — products that can replace factory-farmed meats with more sustainable s...

geneticliteracyproject.org

06/11/2024

Worms to wealth? Loopworm scales up insect protein plant, plans recombinant proteins from silkworms

Loopworm is ramping up production at a facility in Bangalore capable of churning out 6,000t of silkworm and black soldier fly protein a year. The post Worms to wealth? Loopworm scales up insect protein plant, plans recombinant proteins from silkworms appeared first on AgFunderNews.

agfundernews.com

hermetia illucens

01/11/2024

From pests to plates: Can insects play a role in diversifying our diets? Insect protein is stepping into the spotlight as a nutrient-rich, environmentally friendly option to traditional meats

When it comes to food choices, I'm not here to judge — I enjoy a good beef burger myself and have grown up on traditional meat dishes. But, like many, I'm open to exploring new options, which recently led me to try something a bit out of the ordinary: an insect burger.To be honest, it wasn't bad! But I did need a moment to get past the initial 'ick factor'.This reaction is common and often culturally shaped. Our love of black pudding, ...

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Product - articles

Sources : HAL, Pubmed, BASE, MDPI, F100Research, Jounal of Insects as Food and Feed, ...

31/12/2024

Dietary substitution of fishmeal by yellow mealworm and its effects on growth and metabolism-related gene expressions in Acipenser stellatus - Safari et al.

Abstract Yellow mealworm, Tenebrio molitor (Y-MW) was replaced at 5%, 10% and 20% ration levels with fish meal in the diet of the stellate sturgeon, Acipenser stellatus in view of reducing the consumption of fish meal and after that the effects of this replacement were investigated. Fish were fed four dietary regimes in three replicates for two months including: CTRL: fish fed a diet containing full fish meal diet, M5: fish fed ...

brill.com

tenebrio molitor

28/12/2024

DNA-based authentication for insect-based feedstuffs: The case study of Tenebrio molitor and Hermetia illucens - Filipa-Silva et al.

The rising demand for new protein sources increases the risk of fraud, particularly through misleading labelling, that can pose biosecurity hazards, s...

www.sciencedirect.com

hermetia illucens tenebrio molitor

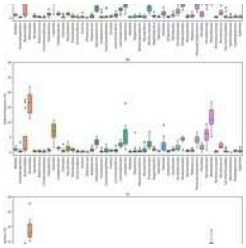
27/12/2024

Evaluation of the physical and chemical quality of Atlantic salmon feed with inclusion of full fat black soldier fly or mealworm meal: Extrusion trials and modelling - Cheng et al.

The physical pellet quality parameters and the chemical changes due to the inclusion of black soldier fly larvae (BSFL) and mealworm (MW) in an Atlant...

www.sciencedirect.com

hermetia illucens tenebrio molitor



27/12/2024

Black soldier fly larvae: a one health approach to investigate gut, and organ health and meat quality response in slow-growing chickens - Fiorilla et al.

Background The inclusion of sustainable protein sources in poultry feed has become essential for improving animal welfare in livestock production. Black soldier fly larvae are a promising solution due to their high protein content and sustainable production. However, most research has focused on fast-growing poultry breeds, while the effects on native breeds, such as the Bianca di Saluzzo, are less explored. This study aimed to ...

link.springer.com

hermetia illucens

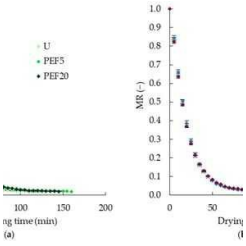
24/12/2024

Defatted black soldier fly meal in diets for juvenile pirarucu, Arapaima gigas: Digestibility, growth performance and health parameters - Gonçalves et al.

Black soldier fly larvae meal is a promising alternative ingredient for animal feeds due to its high protein content and relatively well-balanced amin...

www.sciencedirect.com

hermetia illucens



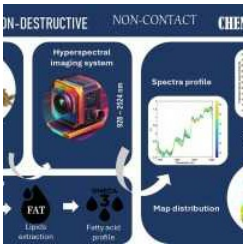
23/12/2024

The Effect of Unconventional Technologies on Carbon Emissions During the Convective Drying of Yellow Mealworm (Tenebrio molitor L.) Larvae and the Selected Physical Properties Thereof - Bogusz et al.

The drying of insects is an important step in their processing. This research aimed to investigate the impact of a pulsed electric field (PEF), immersion in ethanol (EtOH), and combined (immersion in EtOH followed by PEF) treatment on the convective drying process, the emission of CO2, and the quality of the dried insects with regard to such elements as water content and activity, rehydration and hygroscopic properties, optical ...

www.mdpi.com

tenebrio molitor



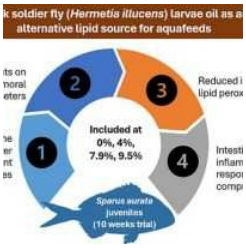
22/12/2024

Prediction of total lipids and fatty acids in black soldier fly (Hermetia illucens L.) dried larvae by NIR-hyperspectral imaging and chemometrics - Cruz-Tirado et al.

The unique fatty acid composition of BSF larvae oil makes it suitable for various applications, including use in animal feed, aquaculture, biodiesel p...

www.sciencedirect.com

hermetia illucens



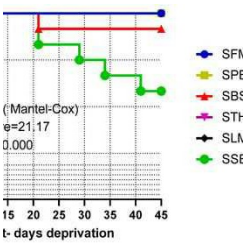
15/12/2024

Hermetia illucens larvae oil as an alternative lipid source: Effects on immune function, antioxidant activity, and inflammatory response in gilthead seabream juveniles - Moutinho et al.

Hermetia illucens larvae oil (HIO) is a promising new ingredient that can potentially be an alternative lipid source in aquafeeds. To assess its viabi...

www.sciencedirect.com

hermetia illucens



12/12/2024

Can Different Dietary Protein Sources Influence the Survival, Growth, and Physiology of 0+Marron (Cherax cainii) Exposed to Feed Deprivation? - Dao et al.

We investigated the effect of feed deprivation for 45 days on the growth, immunity, and health of 0+marron (Cherax cainii) initially fed for 110 days on various protein sources including fishmeal (FM), poultry by-product meal (PBM), black soldier fly meal (BSFM), soybean meal (SBM), lupin meal (LM), and tuna hydrolysate. The marron were weighed and sacrificed immediately after feeding stopped (day 0) and at days 15, 30, and 45 ...

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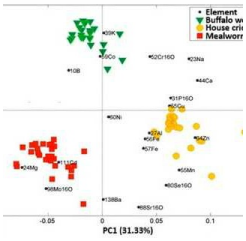
hermetia illucens



12/12/2024

Differentiation of Insect Flours by Elemental Analysis and Chemometrics: A Study Using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) - Montanaro et al.

Background: This study aimed to validate a method for characterizing and quantifying the multi-elemental profiles of different insect flours to enable their distinction, identification, and quality assessment. The focus was on three insect species: cricket (Acheta domesticus), buffalo worm (Alphitobius diaperinus), and mealworm (Tenebrio molitor). Methods: Mealworms were powdered in the laboratory through mechanical processing. ...

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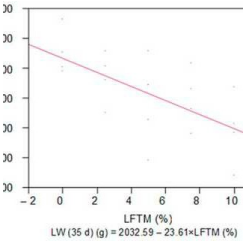
tenebrio molitor



11/12/2024

Low-Fat Tenebrio molitor Meal as a Component in the Broiler Diet: Growth Performance and Carcass Composition - Petkov et al.

Tenebrio molitor is considered a sustainable protein source for diets in poultry. It has been investigated in regard to the performance, health status, and product quality in different poultry species. This study was designed to evaluate the effect of low-fat Tenebrio molitor meal (LFTM) included in the broilers' diet on the growth performance and carcass composition of the birds. The trial was conducted at the Institute of Animal ...

www.mdpi.com

tenebrio molitor

11/12/2024

Impact of processing technologies on insect meal digestibility in rainbow trout (Oncorhynchus mykiss) and European sea bass (Dicentrarchus labrax) - Mastoraki et al.

Abstract The objective of this study was to compare the apparent digestibility coefficients (ADCs) of nutrients and energy of three differently processed black soldier fly (BSF) meals in rainbow trout and European sea bass. The processing techniques included defatting with heat treatment followed by tricanter centrifugation, with or without an enzyme hydrolysis step, as well as microwave drying. In the experimental design, each ...

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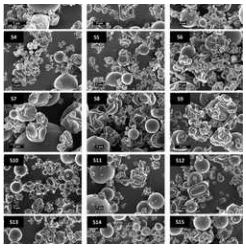
hermetia illucens



10/12/2024

Optimization of Coaxial Spray-Drying for the Encapsulation of Tenebrio molitor Protein Hydrolysate Exhibiting DPP-IV Inhibitory Activity - Berraquero-García et al.

This study aims to optimize the encapsulation of Tenebrio molitor protein hydrolysate exhibiting dipeptidyl peptidase-IV (DPP-IV) inhibitory activity using coaxial spray-drying, a novel technique that enhances the stability, protection, and efficacy of bioactive compounds for use in functional foods. The variables investigated included solids content in the core feed, solids content in the shell feed, and shell/core flow ratio. ...

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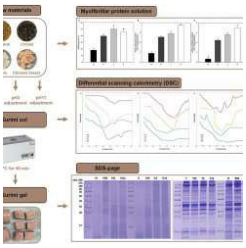
tenebrio molitor



09/12/2024

Physicochemical properties of surimi made from edible insects using washing and pH shift methods - Moon et al.

Edible insects, characterized by their eco-friendly nature and high nutrient value, are promising protein sources. Therefore, we aimed to assess the s...

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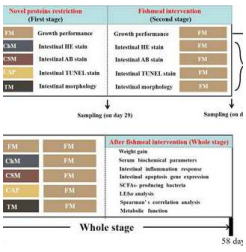
tenebrio molitor



09/12/2024

Fishmeal intervention after short-term novel proteins stimulates compensatory growth and affects intestinal health in largemouth bass (Micropterus salmoides) - Li et al.

This research utilized a compensatory growth phenomenon aimed at reducing the use of fishmeal in aquatic animal feed. However, the compensatory growth triggered by fishmeal restriction with novel protein replacement has yet to be understood. Five isonitrogenous and isolipidic diets containing different proteins were manufactured, with fishmeal serving as the control and diets containing novel proteins, i.e., Chlorella (Chlorella ...

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tenebrio molitor

09/12/2024

Effect of dietary incorporation of defatted yellow mealworm larvae as an alternative protein source on growth, digestive, antioxidant, metabolic enzyme activities, hepatic histomorphology and immunity in pangasius (Pangasianodon hypophthalmus) - Ardra et al.

This study evaluated the impact of defatted yellow mealworm larvae (DYMWL) meal in growth, nutrient utilization, enzyme activities, liver histology, a...

www.sciencedirect.com

tenebrio molitor

09/12/2024

How different successive elaboration methods affect Hermetia illucens meals? Macronutrients, in vitro protein digestibility, oxidative status and hygienic-sanitary quality - Varga et al.

Abstract Insects are an emerging protein alternative in aquaculture. To obtain an easy-to-handle feed with an improved nutritional quality, longer shelf life and better hygienic-sanitary properties, the insects must go through a multi-step process including sacrifice, drying and defatting. This work aims to evaluate the effect of the interaction of different successive methods of processing of Hermetia illucens larvae proximate ...

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hermetia illucens

09/12/2024

Dietary inclusion of black soldier fly, cricket and superworm in rainbow trout aquaculture: impacts on growth and nutrient profiles - Drosdowech et al.

Abstract Inclusion of fishmeal and fish oil in aquafeeds is unsustainable, prompting the need for alternative protein and lipid sources. This study evaluates the impact of diets incorporating defatted black soldier fly larvae (Hermetia illucens), adult cricket (Gryllodes sigillatus) and superworm (Zophobas morio) on the growth performance, nutrient digestibility, nutrient retention efficiency, fatty acid and amino acid profiles ...

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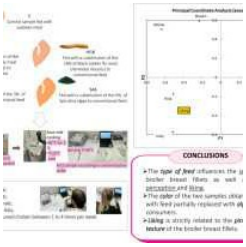
hermetia illucens



06/12/2024

Consumers' perception and liking of breast fillets from broiler chickens fed diets including dehydrated microalgae (Arthrospira spp.) and Black soldier fly (Hermetia illucens) - Roccatello et al.

Recent studies investigate the possibility of including alternative protein sources in broiler chicken diets, e.g., insect and algae. Given the import...

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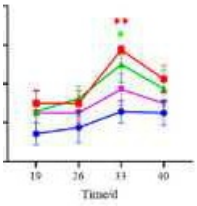
hermetia illucens



02/12/2024

Hermetia illucens Larvae Meal Enhances Immune Response by Improving Serum Immunoglobulin, Intestinal Barrier and Gut Microbiota of Sichuan White Geese After Avian Influenza Vaccination - Xie et al.

Hermetia illucens Larvae Meal (HILM) has been observed to enhance growth performance and immune function, yet the effects and mechanisms in geese remain less understood. Experiment I included 64 Sichuan White Geese to investigate the optimal additive amount of HILM in diet, and experiment II included 32 Sichuan White Geese to access serum immunoglobulin, spleen immune-related genes, intestinal morphology and gut microbiota at the ...

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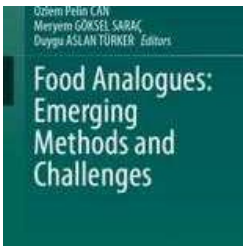
hermetia illucens



01/12/2024

Hybrid Meat Products: Using Plant, Fungi, and Insect Sources for Flexitarian Diets—Technological, Nutritional and Sensory Insights - Câmara et al.

The production of meat proteins is quite costly for the environment as it requires significant amounts of land, water resources, energy, and raw materials. Population growth predicted for 2050 increases global demand for high-quality, complete proteins, such as...

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hermetia illucens tenebrio molitor

30/11/2024

Interaction of dietary replacements of fishmeal by protein blend and feeding frequency on growth performance and protein utilization of gibel carp (Carassius gibelio var. CAS V) - Yu et al.

Feeding frequency represents a potential strategy to improve the utilization of protein sources by fish. This study investigated its impact on the uti...

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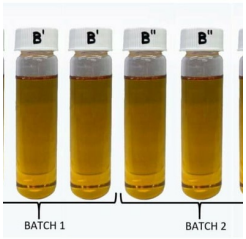
tenebrio molitor



29/11/2024

Exploring the Potential of Yellow Mealworm (Tenebrio molitor) Oil as a Nutraceutical Ingredient - Martínez-Pineda et al.

During defatted Tenebrio molitor (TM) larvae powder production, oil is obtained as a by-product, mainly intended for feed enrichment or as a biofuel component. In 2021, EFSA authorized TM as the first insect to be a novel food. Thus, the study aimed to assess the composition, including fatty acids (FAs), tocopherols, carotenoids, phenolics, volatiles, antioxidant capacity, sensory aroma attributes, physical properties, and oxidative ...

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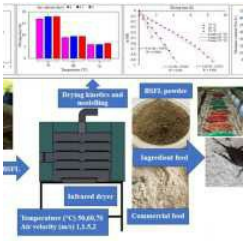
tenebrio molitor



28/11/2024

Optimizing infrared drying of black soldier fly larvae for sustainable cricket feed production - Butwong et al.

As global demand for animal-derived protein surges, Black soldier fly larvae emerge as a promising sustainable feed source, particularly for cricket f...

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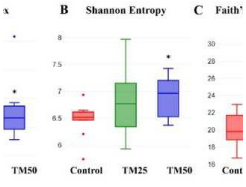
hermetia illucens



28/11/2024

Inclusion of Tenebrio molitor larvae meal in the diet of barbary partridge (Alectoris barbara) improves caecal bacterial diversity and composition - Mahayri et al.

In this study, we investigated the influence of the inclusion of Tenebrio molitor (TM) larvae meal in the diet on the diversity and structure of the bacterial community in the caecal content of Barbary partridges. A total of 36 partridges, selected randomly for slaughter from 54 animals, were divided equally into three treatment groups, including the control group (C) with a diet containing corn-soybean meal and two experimental ...

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tenebrio molitor

26/11/2024

Edible insect protein concentrates: Optimized salt-assisted extraction methods evaluation - Pokorski et al.

This study explores the extraction of proteins from edible insects such as Tenebrio molitor, Acheta domesticus, and Locusta migratoria using alkaline ...

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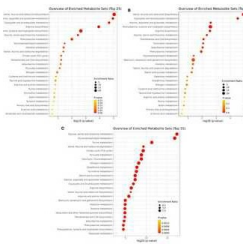
tenebrio molitor



24/11/2024

Metabolomic Profiling of Tenebrio molitor Reared on Chestnut Shell-Enriched Substrate Using NMR Spectroscopy - Ferri et al.

The aim of this study was to evaluate the metabolomic profile of T. molitor larvae reared on the following innovative growth substrates: wheat bran (control, CTRL); wheat bran supplemented with 12.5% w/w chestnut shell (TRT1); and wheat bran supplemented with 25% w/w chestnut shell (TRT2) for 14 days of trial. At the end of this experiment, larvae were transformed into insect meals for nutritional characterization. Nuclear Magnetic ...

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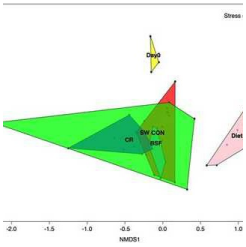
tenebrio molitor



23/11/2024

Influence of feeding black soldier fly (Hermetia illucens), cricket (Gryllodes sigillatus), and superworm (Zophobas morio) on the gut microbiota of rainbow trout (Oncorhynchus mykiss) - Drosdowech et al.

AbstractAim. This study investigates how replacing fishmeal and fish oil with insect meals in feed impacts the gut microbiota in rainbow trout (Oncorhynchu

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hermetia illucens

22/11/2024

Determination of microplastics in reared black soldier fly larvae (Hermetia illucens) using polarised light optical microscopy - Dam et al.

Abstract Microplastics have become ubiquitous in the environment and are increasingly found in a variety of matrices, including in animal feed. At the same time, the presence of plastics from packaging materials in animal feed is still prohibited in the European Union. This is a major barrier preventing certain organic waste streams from being repurposed as feed. However, issues associated with the presence of plastic particles ...

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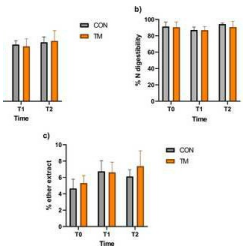
hermetia illucens



21/11/2024

Microbiota modulation by the inclusion of Tenebrio molitor larvae as alternative to fermented soy protein concentrate in growing pigs diet - Ferri et al.

Tenebrio molitor meal represents a promising protein source for animal nutrition due to its low environmental impact and high nutritional value. To date, there is limited data in the literature regarding the effects of Tenebrio molitor meal on the modulation of gut microbiota in growing animals, with most results focusing on poultry rather than pigs. The aim of this study was to evaluate the effects of replacing fermented soy protein ...

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tenebrio molitor

20/11/2024

Effects of High Pressure and Ultrasonication Pretreatments and Supercritical Carbon Dioxide Extraction on Physico-Chemical Properties of Edible Insect Oils - Boonmee et al.

Edible insects reared in Thailand can provide alternative and sustainable sources of protein and oil for food and feed using eco-friendly extraction methods to produce high-value ingredients.

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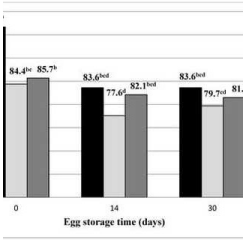
hermetia illucens



20/11/2024

Effect of Different Dietary Doses of Black Soldier Fly Meal on Performance and Egg Quality in Free-Range Reared Laying Hens - Romero et al.

(1) Background: Given the problems currently posed by the use of soybean meal in poultry feeding, its replacement with black soldier fly (BSF) meal may be a suitable strategy. Therefore, this study evaluated the effect of this dietary replacement on laying performance, egg quality, and yolk nutritional composition in free-range reared hens. (2) Methods: Three diets were formulated: a control diet with 210 g/kg of soybean meal, ...

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hermetia illucens

20/11/2024

Cutting-edge exploration of insect utilization in ruminant nutrition—feature and future: a systematic review and meta-analysis - Gao et al.

1 Introduction By the year 2050, the global human population is projected to reach approximately 9.5 billion, necessitating a corresponding 70% increase in demand for animal-based food production, such as milk and meat (1). The primary livestock categories include pigs, with a production of 112.33 million metric tons (MT); poultry, with 109.02 million MT; and cattle (including beef and buffalo meat), with 67.99 million MT, collectively representing 91.80% of global meat production (2). As the most populous country globally, China has ...

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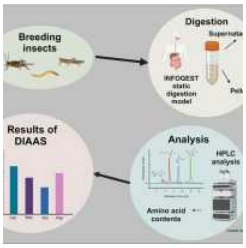
hermetia illucens tenebrio molitor



16/11/2024

Evaluating protein quality in edible insects: A comparative analysis of house cricket, yellow mealworm, and migratory locust using DIAAS methodologies - Lampová et al.

Edible insects have garnered attention as a sustainable and nutritious food source, offering a solution to food security challenges. They are rich in ...

www.sciencedirect.com

tenebrio molitor

16/11/2024

Effects of adding mealworm (Tenebrio molitor L.) as a replacement for fish meal to broiler chicken diet on performance, carcass parameters, meat quality and nutrient digestibility - Parlar et al.

The objective of the study was to investigate how substituting fish meal (FM) with mealworm larval (Tenebrio molitor L.) meal (TM) in the diet affects the growth performance, meat quality, nutrient digestibility, and carcass of broiler chicks. A total of one hundred chicks were divided into five groups, each containing twenty birds. The fish meal was replaced with mealworm meal at different levels of 25% (TM25), 50% (TM50), 75% ...

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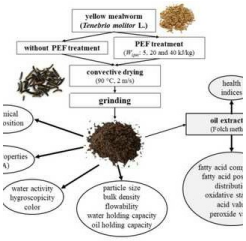
tenebrio molitor



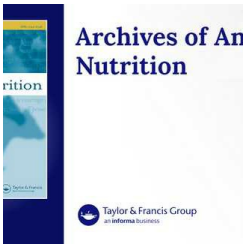
13/11/2024

Quality assessment of yellow mealworm (Tenebrio molitor L.) powders processed by pulsed electric field and convective drying - Bogusz et al.

Edible insects offer opportunities for food production, as they are an interesting source of many nutrients. In this study, the effect of pulsed electric field (PEF) and convective drying on the chemical composition with emphasizing the fat properties as well as physical, techno-functional, and thermal properties of yellow mealworm powders was investigated. The chemical composition of the yellow mealworm powders differed by PEF. ...

www.nature.com

tenebrio molitor



08/11/2024

Estimation of the digestible energy value of fat obtained from black soldier fly larvae (Hermetia illucens) for growing pigs - Yordanova et al.

An experiment was conducted to determine the digestible energy (DE) of insect fat (IF) from black soldier fly larvae (BSLF) for growing pigs. Saturated fatty acids (SFA) were the dominant group of ...

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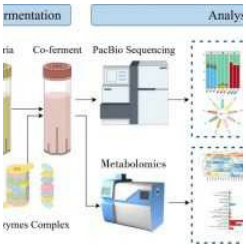
hermetia illucens



06/11/2024

Untargeted metabolomics and PacBio analysis on bioactive components and microbial community in co-fermentation of black soldier fly larva - Liu et al.

Fermentation can enhance nutritional value and safety of insect protein, this study utilized probiotic Bacillus subtilis (B. subtilis) and complex enz...

www.sciencedirect.com

hermetia illucens

03/11/2024

Effect of black soldier fly (Hermetia illucens) larvae meal and oil on the performance, biochemical profile, intestinal health and gut microbial dynamics in laying hens - Khan et al.

This study investigated the effect of incorporating black soldier fly (BSF) larvae meal and oil on laying hens' performance, egg quality, serum profil...

www.sciencedirect.com

hermetia illucens

Industrial applications - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

16/12/2024

Opportunities for Insect Feed Production in Ukraine Insect feed production; Ukraine agriculture; Circular economy; Protein alternatives; Livestock feed; Sustainable development Nieuwsbericht | 16-12-2024 | 10:55

Opportunities for Insect Feed Production in Ukraine Nieuwsbericht | 16-12-2024 | 10:55Insect feed production represents an innovative and sustainable approach to addressing the growing demand for animal feed while reducing environmental impact. This emerging sector offers significant opportunities for Ukraine, a country with a strong agricultural foundation and a need for diversified protein sources. Beeld: ©#UAgroNL Insect feed production facility in Ukraine What is Insect Feed Production? ...

www.agroberichtenbuitenland.nl

hermetia illucens

25/11/2024

Insects: A turnkey solution to feed sustainability

In December 2024, the Regulation on Deforestation-Free Products (EUDR) is anticipated to take effect, aiming to reduce deforestation and forest degradation. Insect ingredients are a turnkey feed solution, promising a lower footprint and better performance. SUSTAINABILITY & WELFARE SPECIAL 2024 – read all articles The new Regulation on Deforestation Free Products (EUDR) will require businesses selling within or [...]

www.allaboutfeed.net

hermetia illucens

21/11/2024

Europe's insect protein industry: Policy and Progress go hand in hand – International Platform of Insects for Food and Feed, Brussels

IPIFF's Annual Congress this year (21 November) concluded with a strong message of optimism and determination for the future of sustainable protein production in Europe. The high-level event brought together a diverse array of stakeholders, including senior EU policymakers, agri-food chain representatives, academic experts, and business leaders. Their insights underscored the insect farming sector's growth, challenges, and oppo...

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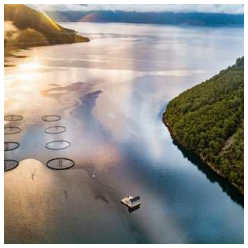


20/11/2024

Why insect meal should be treated as a functional feed ingredient

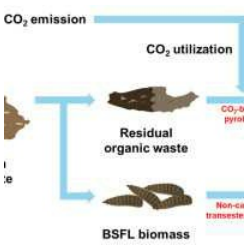
Recently completed on-farm trials have demonstrated that high-quality insect meal from Protix contains functional properties that can improve fish performance and welfare, as well as famers' profitability.

thefishsite.com

hermetia illucens

Industrial applications - articles

Sources : HAL, Pubmed, BASE, MDPI, F100Research, Jounal of Insects as Food and Feed, ...



30/12/2024

Synergistic integration of entomological and thermochemical approaches for the sustainable energy production from organic waste - Kim et al.

The technical limitations of single waste valorisation platforms are evident. To address these, this study combined entomological and thermochemical a...

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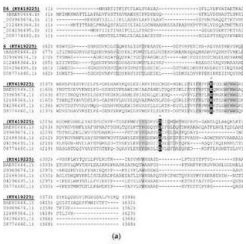
hermetia illucens



30/12/2024

Isolation of a Novel Low-Temperature-Active and Organic-Solvent-Stable Mannanase from the Intestinal Metagenome of Hermetia illucens - Kim et al.

The black soldier fly, Hermetia illucens, is a voracious scavenger of various organic materials; therefore, it could be exploited as a biological system for processing daily food waste. In order to survey novel hydrolytic enzymes, we constructed a fosmid metagenome library using unculturable intestinal microorganisms from H. illucens. Through functional screening of the library on carboxymethyl cellulose plates, we identified a ...

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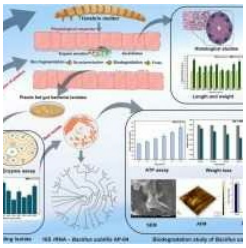
hermetia illucens



26/12/2024

Exploring the plastic-fed Indian mealworm (Tenebrio molitor) gut bacterial strain (Bacillus subtilis AP-04) – A potential driver of polyethylene degradation - Akash et al.

Plastic biodegradation by microbes is an environmentally friendly and sustainable approach that has no negative consequences. In this study, mealworms...

www.sciencedirect.com

tenebrio molitor

25/12/2024

Comprehensive utilization of black soldier fly (Hermetia illucens) larvae: extraction, recovery and characterization of peptide, chitin and melanin and scaling-up trial - Chen et al.

The nutrients, chitin and pigments resources in black soldier fly (Hermetia illucens) (BSF) recently attracts attention. However, current procedure fo...

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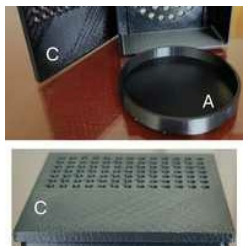
hermetia illucens



25/12/2024

Estimating optimal temperature conditions for growth, development, and reproduction of Tenebrio molitor (Coleoptera: Tenebrionidae) - Morales-Ramos et al.

Abstract. The yellow mealworm, Tenebrio molitor L., is one of the most important industrialized insects worldwide. As a poikilotherm, T. molitor requires a

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tenebrio molitor

24/12/2024

Insect farming: A bioeconomy-based opportunity to revalorize plastic wastes - Sanchez-Hernandez et al.

Managing plastic waste is one of the greatest challenges humanity faces in the coming years. Current strategies—landfilling, incineration, and recycli...

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tenebrio molitor

22/12/2024

Sustainable approach to polystyrene management and bioinsecticide production: Biodegradation by Tenebrio molitor larvae co-fed with residual biomass and bioactivity of frass pyrolysis bio-oil against insect pests - Urrutia et al.

Tenebrio molitor has gained attention as a potential solution for plastic pollution. This study explored the biodegradation of polystyrene (PS) by mea...

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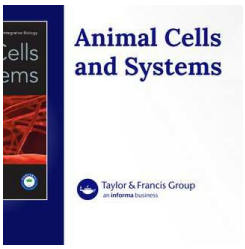
tenebrio molitor



21/12/2024

Protein hydrolysates from Hermetia illucens trigger cellular responses to cope with LPS-induced inflammation and oxidative stress in L-929 cells - Riolo et al.

Insect protein hydrolysates (PH) are emerging as valuable compounds with biological activity. The aim of the present study was to assess the potential cytoprotective effects of PH from the Black So...

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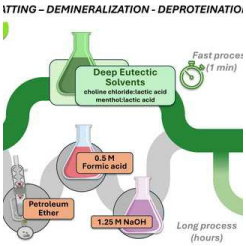
hermetia illucens



20/12/2024

A Pipeline for Green and Ultra-Fast Chitin Extraction from Black Soldier Fly Larvae - Miceli et al.

Insect larvae, such as the ones from Hermetia illucens (black soldier fly, BSF), are used as bioreactors for the upcycling of urban organic waste into high value-added compounds, such as fatty acids, proteins and chitin. A major issue is related to the extraction processes of the main components which are frequently based on high environmentally impacting conditions and substances. On this side, research focused on the use of deep ...

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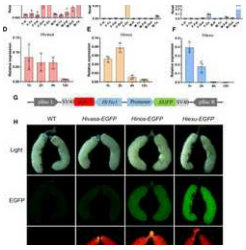
hermetia illucens



19/12/2024

Wingless strain created using binary transgenic CRISPR/Cas9 alleviates concerns about mass rearing of Hermetia illucens - Kou et al.

The development of a binary transgenic knockout system has produced a wingless strain of Hermetia illucens, addressing concerns about insect escape during mass rearing.

www.nature.com

hermetia illucens

18/12/2024

Integrating vermicompost, black soldier fly, and inorganic fertilizers enhances corn growth and yield - Risman et al.

To achieve good agricultural practices and maximize the economic yield of corn, farmers should reduce the use of inorganic fertilizers. A field experiment was conducted in the Chonnabot district, Khon Kaen province, Thailand, during the 2022 and 2023 growing seasons. The aim was to assess the impact of different organic fertilizers and their combinations on the growth and yield of commercial sweet corn (Zea mays L. saccharata) and ...

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hermetia illucens

18/12/2024

Black soldier fly frass from seed waste of nitrogen-rich legumes – How long-term maturation affects the fertilizer properties? - Kaczor et al.

Expanded insect production represents a source of post-breeding residues (frass) that can potentially be used as a soil additive. These types of biofe...

www.sciencedirect.com

hermetia illucens

18/12/2024

Combating Fusarium oxysporum in tobacco soils with black soldier fly larvae frass-based reductive soil disinfestation - Haider et al.

The pervasive issue of continuous monoculture in agricultural practices culminates in the proliferation of soil-borne pathogens. This study investigates the efficacy of Black Soldier Fly Larvae (BS...

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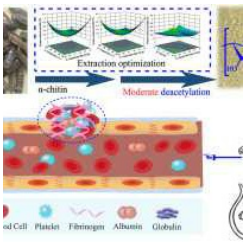
hermetia illucens



18/12/2024

Efficient and green extraction of chitin from Hermetia illucens using deep eutectic solvents and its application for rapid hemostasis - Wang et al.

Hermetia illucens, with a short growth cycle, is promising as a valuable source of chitin. However, the optimal method for extracting chitin from this...

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hermetia illucens

18/12/2024

Effects of salt concentration, temperature, and blanching time on insect protein extraction yield: optimisation by response surface methodology - Kim et al.

Abstract This study aimed to optimise the protein extraction yield from black soldier fly larvae by employing a blanching process to enhance protein solubility and mitigate oxidation. Through response surface methodology, we determined the optimal blanching conditions, with the temperature set at 85.152 °C, a duration of 12.411 s, and a sodium chloride concentration of 0.46 M. These parameters were selected to maximise protein ...

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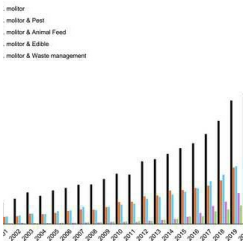

16/12/2024

From a stored-product pest to a promising protein source: a U-turn of human perspective for the yellow mealworm Tenebrio molitor - Adamaki-Sotiraki et al.

The insect species Tenebrio molitor L. (Coleoptera: Tenebrionidae) is a stored-product pest which tend to infest a variety of durable agricultural commodities, mostly oriented toward cereals and related amylaceous substrates of low humidity. Thus, the past few years, research on T. molitor has been focused on its biology, ecology, and control methods due to its pest status. However, recently, the same insect species has undergone ...

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tenebrio molitor

12/12/2024

Review – Insect farming for food and feed in the Global South: Focus on black soldier fly production - Barragán-Fonseca et al.

Clear differences exist between the Global South and the Global North with respect to economic development. The majority of small and medium-sized ins...

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hermetia illucens

11/12/2024

Protein extraction from edible insects: Implications for IgE-binding capacity - Carriço-Sá et al.

Edible insects are attracting increasing interest as sustainable alternative protein sources. Despite being considered a safe food for most population...

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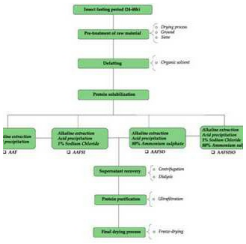
tenebrio molitor



10/12/2024

Effect of Alkaline Extraction - Isoelectric Precipitation and Salt-Assisted Extraction on Physicochemical and Techno-Functional Properties of Black Soldier Fly Larvae Proteins - Zozo et al.

Black soldier fly (BSF) larvae are an increasingly popular source of protein in the food industry, and they are showing great potential as a sustainable alternative to traditional protein sources. However, to fully utilize the potential of insect protein as food, it is important to improve their functional characteristics. The purpose of this study was to thoroughly examine the influence of alkaline extraction and isoelectric p...

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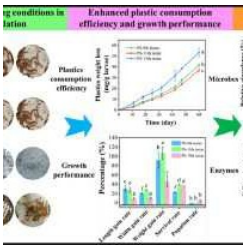
hermetia illucens tenebrio molitor



07/12/2024

Optimizing mealworm rearing conditions and gut microbiome function for enhanced plastics biodegradation - Guo et al.

Insects have become an efficient and eco-friendly bioreactor for plastics and even micro/nano-plastics biodegradation. However, the optimal conditions...

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tenebrio molitor

07/12/2024

Neuroprotective effect of mealworm protein hydrolysate-derived bioactive peptides in human microglial cells - Gonzalez-de la Rosa et al.

Abstract The larva of Tenebrio molitor, better known as mealworm, is one of the most studied insects today, since it was recently classified as safe for human consumption. Specifically, its high protein content makes it a splendid candidate for the search for bioactive peptides, with properties ranging from anti-inflammatory to neuroprotective. In this study, the effect of a digested hydrolysate on microglia cells (which previously ...

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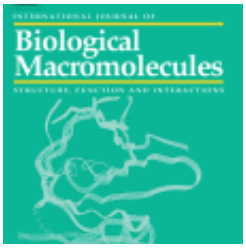
tenebrio molitor



03/12/2024

Extraction of chitin and chitosan from Hermetia illucens breeding waste: A greener approach for industrial application - Elouali et al.

Sustainably exploiting the waste of the black soldier fly (BSF) to produce chitin and chitosan remains a challenge. This work valorizes the pupal case...

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hermetia illucens

02/12/2024

The Mexican fruit fly puparia (Anastrepha ludens) and the black soldier fly imagoes (Hermetia illucens), promising alternative sources of chitin - Martín-López et al.

Insects are renewable biomass with rapid reproduction rates and minimal resource consumption, their cultivation has become a long-term option for food production and increasing amounts of this chitin-rich biomass are becoming available. Chitin from black soldier fly (Hermetia illucens) has been studied during its development cycle, finding highest concentration on puparia generally extracted by acid–base method to remove minerals and proteins. The Mexican fruit fly (Anastrepha ludens) used as biocontrol insect also represents a potential ...

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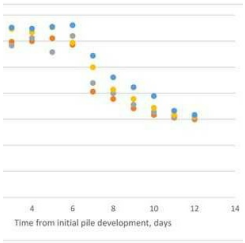

30/11/2024

Evaluating Black Soldier FLY (Hermetia illucens) Frass and Larval Sheddings in the Production of a Quality Compost - Kenchanna et al.

Black Soldier Fly (Hermetia illucens) is well-known for having a high protein and lipid content during its larval stage and is cultivated for animal feed. Rearing Black Soldier Fly larvae (BSFL) produces byproducts known as frass and larval sheddings in large volumes with limited applications. Therefore, there is a need to identify viable sustainable management strategies to prevent potential environmental issues associated with ...

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hermetia illucens

30/11/2024

Combining Tenebrio molitor frass with inorganic nitrogen fertilizer to improve soil properties, growth parameters, and nutrient content of Sonchus oleraceus crop - Karkanis et al.

This study evaluates the impact of yellow mealworm frass in combination with an inorganic nitrogen fertilizer on growth, yield, and nutrient concentra...

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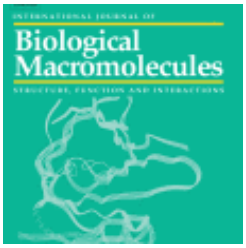
tenebrio molitor



28/11/2024

Insect chitosan derived from Hermetia illucens larvae suppresses adipogenic signaling and promotes the restoration of gut microbiome balance - Kim et al.

Chitosan, the deacetylated form of chitin, is considered a valuable source of compounds in the feed and food industries. However, the impact of Hermet...

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hermetia illucens

21/11/2024

Insect frass from upcycling vegetable by-products with cereals: Effects on the soil properties, plant development and soil invertebrate fitness - Malheiro et al.

The use of insects in organic management systems is expanding due to their ability to recycle waste into valuable co-products for agriculture, notably...

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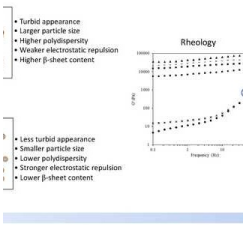
hermetia illucens



20/11/2024

Heat-induced gelation of black soldier fly larvae (Hermetia illucens) protein: aggregation and rheological characterization - Chia et al.

The potential of utilizing black soldier fly larvae (BSFL) protein in food applications requires comprehensive understanding of their techno-functionalities under various processing conditions. This study aimed to investigate the gelling behaviour of BSFL proteins through characterising their aggregation and rheological properties at different temperatures (55–95 °C). The results of turbidity, particle size distribution, polydispersity ...

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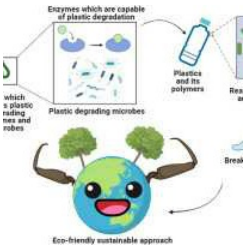
hermetia illucens



19/11/2024

Harnessing insects mediated plastic biodegradation: Current insight and future directions - Murthy et al.

Plastic polymers pose a significant challenge due to their resistance to degradation, resulting in their persistent accumulation in the environment an...

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16/11/2024

Chitosan obtained from black soldier fly larval cuticles expands the value chain and is effective as a biocontrol agent to combat plant pathogens - Escobar Rodríguez et al.

The industrial use of certain insects, such as the black soldier fly (BSF, Hermetia illucens), has become a burgeoning way of converting residual biom...

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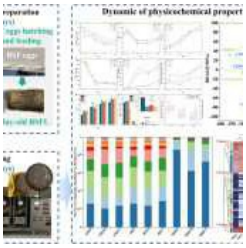
hermetia illucens



14/11/2024

An efficient strategy to promote food waste composting by adding black soldier fly (Hermetia illucens) larvae during the compost maturation phase - Quan et al.

The increasing generation of food waste (FW) poses a significant challenge to global food security and environmental sustainability. Composting is an ...

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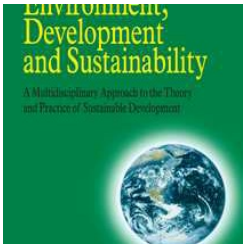

13/11/2024

Promising concepts to increase the competitiveness of the insect business in Central Europe - Marounšková et al.

Significant progress in Hermetia illucens (hereinafter BSF) rearing and refining over the last 2 decades has attracted attention of many investors all over the globe. In subtropical and tropical regions, emerging businesses are rapidly expanding to capitalize on the semi-automated conversion of food waste into a wide range of higher value-added products. In the Northern Hemisphere, however, regulatory bodies intervene more strictly, ...

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hermetia illucens

13/11/2024

Protein extraction from yellow mealworm (Tenebrio molitor) assisted by pulsed electric fields: Effect on foaming properties - Perez et al.

This study focuses on the use of Pulsed Electric Field (PEF) as a non-thermal technology to extract proteins from defatted Yellow Mealworm (Tenebrio m...

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tenebrio molitor

12/11/2024

Sustainability and Perspectives of Edible Insect Rearing and Utilization of Their Products and Byproducts - Errico

This Special Issue, titled “Sustainability and Perspectives of Edible Insect Rearing and Utilization of Their Products and Byproducts”, aimed to gather high-quality scientific contributions suggesting innovative solutions for rearing edible insects and new perspectives on the use of rearing products and by-products [...]

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hermetia illucens tenebrio molitor

04/11/2024

New insights into the organic waste-derived black soldier fly chitin and chitosan for biomedical and industrial applications - Mohan et al.

Insects are a promising group of animals for value-added biorefining products. Among other insects, the Black Soldier Fly (BSF) Hermetia illucens has ...

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hermetia illucens

04/11/2024

The effect of phenotyping, adult selection, and mating strategies on genetic gain and rate of inbreeding in black soldier fly breeding programs - Slagboom et al.

Background The aim of this study was to compare genetic gain and rate of inbreeding for different mass selection breeding programs with the aim of increasing larval body weight (LBW) in black soldier flies. The breeding programs differed in: (1) sampling of individuals for phenotyping (either random over the whole population or a fixed number per full sib family), (2) selection of adult flies for breeding (based on an adult individual's ...

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hermetia illucens

01/11/2024

Potential applications of antimicrobial peptides from edible insects in the food supply chain: Uses in agriculture, packaging, and human nutrition - Rivero-Pino et al.

The search for ingredients from novel sources is gaining interest within the framework of promoting a more sustainable food system. The exploration of...

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- Make it a standard? The creation and variability assessment of a consensus standard protocol for Tenebrio molitor larvae feeding trials - Deruytter et al.

Product - media

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- Discover the Buzz: Is Insect Protein Powder the New Whey?
- lifestyle Grab your grub: $4.90 mealworm snack lands at Sheng Siong, joining Singapore's insect-food scene
- Agroloop opens industrial-scale insect protein processing plant
- Innovafeed secures $11.8m USDA grant for insect-based fertilizer, fine tunes process at Decatur pilot plant
- Western diets need to change to meet sustainability challenges. How resistant will consumers be to munch on insects or plant-based meats
- Worms to wealth? Loopworm scales up insect protein plant, plans recombinant proteins from silkworms
- From pests to plates: Can insects play a role in diversifying our diets? Insect protein is stepping into the spotlight as a nutrient-rich, environmentally friendly option to traditional meats

Product - articles

- Dietary substitution of fishmeal by yellow mealworm and its effects on growth and metabolism-related gene expressions in Acipenser stellatus - Safari et al.
- DNA-based authentication for insect-based feedstuffs: The case study of Tenebrio molitor and Hermetia illucens - Filipa-Silva et al.
- Evaluation of the physical and chemical quality of Atlantic salmon feed with inclusion of full fat black soldier fly or mealworm meal: Extrusion trials and modelling - Cheng et al.
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- The Effect of Unconventional Technologies on Carbon Emissions During the Convective Drying of Yellow Mealworm (Tenebrio molitor L.) Larvae and the Selected Physical Properties Thereof - Bogusz et al.
- Prediction of total lipids and fatty acids in black soldier fly (Hermetia illucens L.) dried larvae by NIR-hyperspectral imaging and chemometrics - Cruz-Tirado et al.
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- Optimization of Coaxial Spray-Drying for the Encapsulation of Tenebrio molitor Protein Hydrolysate Exhibiting DPP-IV Inhibitory Activity - Berraquero-García et al.
- Physicochemical properties of surimi made from edible insects using washing and pH shift methods - Moon et al.
- Fishmeal intervention after short-term novel proteins stimulates compensatory growth and affects intestinal health in largemouth bass (Micropterus salmoides) - Li et al.

- Effect of dietary incorporation of defatted yellow mealworm larvae as an alternative protein source on growth, digestive, antioxidant, metabolic enzyme activities, hepatic histomorphology and immunity in pangasius (Pangasianodon hypophthalmus) - Ardra et al.
- How different successive elaboration methods affect Hermetia illucens meals? Macronutrients, in vitro protein digestibility, oxidative status and hygienic-sanitary quality - Varga et al.
- Dietary inclusion of black soldier fly, cricket and superworm in rainbow trout aquaculture: impacts on growth and nutrient profiles - Drosdowech et al.
- Consumers' perception and liking of breast fillets from broiler chickens fed diets including dehydrated microalgae (Arthrospira spp.) and Black soldier fly (Hermetia illucens) - Roccatello et al.
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- Interaction of dietary replacements of fishmeal by protein blend and feeding frequency on growth performance and protein utilization of gibel carp (Carassius gibelio var. CAS V) - Yu et al.
- Exploring the Potential of Yellow Mealworm (Tenebrio molitor) Oil as a Nutraceutical Ingredient - Martínez-Pineda et al.
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- Insects: A turnkey solution to feed sustainability
- Europe's insect protein industry: Policy and Progress go hand in hand – International Platform of Insects for Food and Feed, Brussels
- Why insect meal should be treated as a functional feed ingredient

Industrial applications - articles

- Synergistic integration of entomological and thermochemical approaches for the sustainable energy production from organic waste - Kim et al.
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